

# A Tough Old Bird?

## No More!

To a chicken lover, there are few things better than a tender, juicy chicken breast as part of a satisfying meal. More than likely, the succulent morsels came from a young, broiler-type bird, one specifically raised to cook whole or in pieces. But a new processing step developed by Agricultural Research Service scientists may allow older, layer birds, those that produce eggs for table use, to be processed at a later time just like broiler birds. Usually these mature birds are processed for lower value items such as feed, pressed products like chicken nuggets, or canned products such as soup.

ARS researchers J. Andra Dickens, Clyde E. Lyon, Richard J. Buhr, of the Poultry Processing and Meat Quality Research Unit, and Brenda G. Lyon, of the Quality Assessment Research Unit, found that electrical stimulation of the carcasses makes breast meat of mature layer hens more tender, speeds up the


processing time, and allows processors to save space.

In 2000, poultry plants processed more than 8.25 billion broilers, valued at more than \$14 billion. In December 2001, the U.S. inventory of laying hens was estimated to be 335 million birds, most of which could be processed as high-quality meat by using electrical stimulation.

“Electrical stimulation will allow more breast meat from older birds to be sold at retail prices, as boneless breast fillets, for example,” says Dickens.

Processing broilers is an assembly-line affair with time built in for chilling the meat before removing the bone. Breast muscle that remains on the bony frame for 4 to 6 hours after the bird has been processed is deemed to have optimal tenderness.

Reducing on-the-bone chilling time interferes with the process of rigor mortis, making cooked meat tough and chewy. But, says Dickens, “After chilling for 2 hours, the electrically stimulated carcass is ready to be deboned, allowing workers to do this step during the same shift instead of waiting for the next shift. It saves the processor a lot of time.”



Food scientist Gene Lyon begins to remove the large breast muscles from an electrically stimulated chicken carcass. The meat will be tested for tenderness and other textural characteristics.

The reason processors store carcasses in refrigerated compartments is to allow the natural contraction of the muscle (rigor mortis) to subside. This typically takes 8 to 24 hours. As unused energy in the form of glycogen dissipates, the muscle relaxes and the bird can be removed from refrigerated storage. ARS researchers have found that applying pulsed electrical current forces muscles to use stored glycogen more rapidly.

“Using electrical stimulation eliminates the need to store carcasses in refrigerators for the standard 8 to 24 hours, which can save processors millions of dollars annually,” says Dickens.

And lower costs for industry usually translate into savings for consumers.—  
By **Sharon Durham**, ARS.

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